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## AIR & RADIATION LAW NEWS FOR JANUARY 17, 2013

### HIGHLIGHTS

#### EPA Analysis Shows Releases of Toxics Rose 8 Percent in 2011

Total releases and transfers of toxic chemicals in the United States increased by 8 percent from 2010 to 2011, to 4.09 billion pounds, according to an analysis by EPA of Toxics Release Inventory data. The rise is mainly due to increases in land disposal at metal mines, where small changes in the composition of the ore being mined can lead to big changes in the amount of toxic chemicals reported, EPA says. It is the second year in a row in which releases have increased. ... More »

#### California in Talks With Australia on Linkage of Emissions Trading Schemes

California and Australia launch official discussions to explore how the two governments could link their greenhouse gas emissions programs. California Air Resources Board Chairman Mary D. Nichols tells a forum that coincided with the talks that there are opportunities to collaborate with Australia and other governments. If formal linkage is not possible, there are other ways to work together, share expertise, and develop "even better and more attractive models," she tells the University of California-Davis forum. ... More »

#### Energy Department Likely to Rewrite Furnace Standards to Settle Suit

The Energy Department would be required, under a proposed legal settlement, to rewrite energy efficiency standards for furnaces just months before the rules issued last year are scheduled to go into effect. The settlement, filed jointly by DOE and the American Public Gas Association in the U.S. Court of Appeals for the District of Columbia Circuit, would vacate a portion of a rule setting new efficiency standards for non-weatherized natural gas furnaces, the most common type of furnace used and sold in the United States. ... More »

#### NRC Looks to Integrate Spent Fuel Storage, Transportation Rules

The Nuclear Regulatory Commission is considering a rulemaking to integrate requirements for dry cask storage of spent nuclear fuel and the packaging and transportation of such material. NRC is evaluating its storage and transportation regulatory structure in anticipation of longer storage duration and more nuclear power plants storing high burnup fuel—fuel with peak rod average burnup greater than 45,000 megawatt days per metric ton of uranium, the agency says. ... More » ... The NRC expects to release in early March a report on the scoping process for a draft environmental impact statement to support a revised radioactive waste confidence rule. ... More »

#### Rep. Gibbs to Return as Chairman of House Transport Subcommittee

Rep. Gibbs retains his chairmanship of the House Transportation and Infrastructure Subcommittee on Water Resources and Environment, the panel with jurisdiction over Clean Water Act issues, as Committee Chairman Shuster announces subcommittee heads. Rep. Denham will chair the Railroads,

Pipelines, and Hazardous Materials subcommittee. ... More » ... The House Appropriations Committee announces subcommittee assignments, including those for the panel that oversees most environment funding. ... More »

#### OUTLOOK 2013

**ENFORCEMENT:** EPA is expected to continue targeting its enforcement actions against the largest sources of air pollution, particularly coal-fired power plants. ... More »

**MAJOR COURTS:** The U.S. Supreme Court will have decisions in Clean Water Act and water rights cases, while lower federal court dockets are busy with cases addressing air pollution, solid waste, renewable fuels, mining, and other issues. ... More »

**SUSTAINABILITY:** The number of U.S. companies disclosing their greenhouse gas emissions, water use, and other environmental data is expected to rise, according to corporate sustainability practitioners and analysts. ... More »

#### ALSO IN THE NEWS

**CLIMATE CHANGE:** Preservation of Virginia's coastal region will require a commitment to address politically difficult land-use restrictions as well as major investments in flood-prevention infrastructure, a report to the governor says. ... More »

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Inside EPA Weekly Report, 1/18/13

<http://insideepa.com/Inside-EPA/Inside-EPA-01/18/2013/menu-id-67.html>

#### EPA Faces Suits After Rejecting Bid For More Ozone Nonattainment Areas

Environmentalists say they are likely to sue EPA after it rejected their request to expand the number of areas deemed out of attainment with the agency's 2008 ozone national ambient air quality standard (NAAQS), a decision that will help several states avoid having to impose more aggressive pollution controls required in nonattainment areas.

#### EPA Urged To Clarify Overlap With OSHA On Vapor Intrusion Limits

EPA is being urged to clarify when its upcoming standards for addressing vapor intrusion will be implemented at workplace sites and when weaker levels set by Occupational Safety and Health Administration (OSHA) apply, after the agency did not address the issue in a recent draft guideline but had addressed the issue in a 2002 draft.

#### AIR POLLUTION:

Wyo. group sues over EPA's OK of state's haze plan

Jeremy P. Jacobs, E&E reporter

Published: Wednesday, January 16, 2013

Wyoming public health advocates today filed a federal lawsuit challenging U.S. EPA's approval of the state's plan to curb air emissions that cause haze, arguing that it is inadequate.

WildEarth Guardians filed a lawsuit with the 10th U.S. Court of Appeals in Denver that says EPA disregarded its obligations under the Clean Air Act when it approved Wyoming's regional haze plan.

Specifically, the group is challenging how the state's plan sought to address sulfur dioxide (SO<sub>2</sub>) emissions from its coal-fired power plants. The advocates contend that instead of cutting SO<sub>2</sub> emissions, the plan will allow more emissions.

"Just like sulfur, this plan stinks," Jeremy Nichols of WildEarth Guardians said in a statement. "Far from protecting clean air, it actually allows more sulfur dioxide pollution from the state's coal-fired power plants, putting the West's most cherished landscapes and countless communities at risk."

EPA approved Wyoming's regional haze plan on Dec. 12. The advocates contend that by relying on a "milestone," or cap, on SO<sub>2</sub> emissions for the state's power plants, the plan assumed that they emit at a rate of 0.15 pounds per million British thermal units of heat input. The advocates argue that Wyoming's 13 coal-fired plants are already consuming coal at that rate, and many of them can achieve lower rates.

"EPA's plan defies reality and defies what is necessary to safeguard our clean air," Nichols said. "This is an opportunity to make significantly more progress in restoring clear skies in the West that EPA squandered."

The regional haze program has been controversial since EPA rededicated its efforts on it in the last couple of years. The program is designed to restore visibility at 156 national parks to natural levels by 2064. It had been near-dormant until President Obama

took office but revived largely because of court deadlines that resulted from environmental group lawsuits. Industry and states have charged that EPA is not being deferential enough, but environmentalists charge that EPA is capitulating to state demands when finalizing the implementation plans. Advocates have also challenged North Dakota and Montana's implementation plans (Greenwire, June 7, 2012).  
[Click here to read the filing.](#)

#### CLIMATE:

Fight over power plants has parallels to fuel-economy push in Obama's first term

Jean Chemnick, E&E reporter

Published: Wednesday, January 16, 2013

This story was updated at 2:02 p.m. EST.

When he entered the Oval Office four years ago, President Obama gave environmentalists something they had long sought: a presidential commitment to much stronger fuel economy standards.

The same advocates now hope Obama's second term will bring a similar fervor for reining in carbon dioxide emissions from the nation's current fleet of power plants, which contribute 40 percent of America's carbon output.

"What we're asking the administration to do is to treat existing source standards in the same way that they treated the car standards in the first term," David Doniger, policy director of the Climate Center at the Natural Resources Defense Council, said in a recent interview. "It's the big item."

The second tranche of car standards was only finalized in August, so Doniger said he hoped to see Obama hit the ground running on the power plant rule on "Day Two" of his second administration.

"This is a project that will take the full second term, and it needs to be started right at the beginning of the second term, in the same way that the car standards were started at the beginning of the first term," he said.

Conrad Schneider, advocacy director for the Clean Air Task Force, echoed this hope.

"We are in consensus in the environmental community, maybe for the first time ever, on what the No. 1 priority for this administration is," he said in a recent interview. "And that is to address carbon pollution from existing coal plants."

The existing power plant standard was the only specific policy item mentioned in a recent letter by a coalition of environmental groups to Obama, signed by NRDC, CATF and others.

"You have the authority under existing law to achieve urgently-needed reductions in the carbon pollution that is disrupting our climate and damaging our health," they wrote, proposing that the rule cut emissions by at least 25 percent by 2020 across the existing fleet. Late last year, NRDC offered a suggestion on how to do that (E&ENews PM, Dec. 4, 2012).

U.S. EPA is widely expected to comply with the terms of a 2010 settlement agreement that requires the agency to write the existing power plant rule, together with a rule for future power plants that was proposed last year and is due to be finalized early this year.

But the controversial Clean Air Act rule may bring with it inherent challenges that the tailpipe emissions rule did not, and that might discourage the White House from playing the same role in its development.

The White House took a very central role in the tailpipe emissions rulemaking, setting the pace with executive office action that the agencies then followed.

Obama's involvement began his first week in office, when he issued a pair of memorandums on Jan. 26, 2009, directing the Department of Transportation to finalize new fuel economy rules and EPA to reconsider California's request for a waiver that would allow it to promulgate its own tailpipe emissions rules for greenhouse gases. Former President George W. Bush's EPA had previously rejected California's bid.

"It was a very clear direction," Doniger said. "It didn't have the content spelled out. It was not a proposal. But it was a direction to go do it."

EPA approved California's waiver in June and issued its endangerment finding in December, paving the way for the agency to write its own tailpipe emissions rules for greenhouse gases.

The White House orchestrated an agreement among automakers, states and other stakeholders the following May, which harmonized state and federal vehicle standards and provided for the coordination of DOT's corporate average fuel economy (CAFE) standards with the new EPA standards.

A second set of standards was completed in August that will extend that program through model year 2025.

John DeCicco, a self-described "CAFE veteran" who worked on automotive environmental policy in Washington for the Environmental Defense Fund, among others, called Obama's fuel economy deal a "huge cow-herding exercise."

But he said it stemmed from the industry's desire to find regulatory certainty amid a changing landscape where increased regulation had become inevitable.

The previous administration had begun to consider raising the standards, if only modestly, to address energy security concerns. Then in 2007 Bush mentioned the need to "reform and modernize" fuel economy standards during his State of the Union address. DeCicco, who is now on the faculty at the University of Michigan, said this signaled to the industry that its allies in Washington would no longer be able to keep fuel economy standards where they had been for nearly three decades.

"To the auto industry, it was like their nightmare had come true," DeCicco said. "Their longtime friends, the Republican administration, had turned on them because the political pressure to do something on energy security was so high at that time."

Later that year, Congress approved and Bush signed into law the Energy Independence and Security Act, which set a fleetwide gasoline mileage standard at 35 miles per gallon by 2020.

But the industry that once voiced qualms about meeting that standard signed on to Obama's agreement calling for 35.5 mpg by 2016 -- less than three years later -- in part to avoid a "pincer movement," as DeCicco put it, by California, which was pushing for its own tailpipe emissions standards. Automakers would have had to bow to California's separate, higher standards in order to compete for its large market share. "That created the leverage for when Obama came in," DeCicco said.

There were other factors that greased the skids for the first-term deal on fuel economy but that might be absent from the discussion on power plants.

For one thing, two of Detroit's Big Three had just been the recipients of a bailout by the U.S. taxpayer. Former EPA Administrator William Reilly said in a recent interview that that may have played a role.

"If the government owned the utilities as it did the car companies, it would probably make it a little easier," he said.

And the fuel economy deal followed a 2008 spike in gasoline prices that some experts blamed for helping bring about the Great Recession.

Michael Livermore, executive director of the Institute for Policy Integrity at the New York University School of Law, said the public accepted that higher fuel economy standards would save them at the pump. "They have a lot of environmental benefits, but they also generate a lot of savings for consumers," he said. "And that's different from what you're talking about with greenhouse gases" from power plants.

While the greenhouse gas rules are economically justified, especially when considering the cost of adapting to climate change, "it's not like putting money in consumers' pockets," Livermore said.

"That energy security dimension on the politics is a very powerful driver for how policy has developed for the auto sector, compared with the utility sector," DeCicco concurred. "There's just not an equivalent."

Advocates for power plant rules can talk about the health care costs that are avoided when the air gets cleaner, but it's a more complicated message, he added.

Bryan Hannegan, vice president of environment for the Electric Power Research Institute, a think tank, said there were also several important differences between the rules themselves, which made the car rule less controversial and more manageable than the power plant rule was likely to be -- and therefore a better candidate for direct presidential involvement.

For one thing, Hannegan said, CAFE sets standards only for new cars -- not the existing fleet, as the power plant rule will seek to do. For another, he said, the Energy Policy Conservation Act, which provides for CAFE standards, allows for the consideration of a variety of factors including the economic consequences of the rule, while in most cases the Clean Air Act does not.

EPA's greenhouse gas tailpipe emissions rules fall under the Clean Air Act, and they are coordinated with DOT's CAFE standards. CAFE standards average over a manufacturer's entire fleet, giving carmakers additional compliance flexibility and cost savings, Hannegan said. But the U.S. Court of Appeals decision last year to remand a Clean Air Act rule for smog- and soot-forming emissions that included an averaging component casts fresh doubt on EPA's authority to use one.

And then, political realities have changed since Obama was first elected. The tea party has gained steam, the House is in Republican hands and Obama has only just begun talking about climate change again.

Livermore said all these factors mean EPA is likely to take the lead on the rule, rather than becoming "part of an overarching political strategy germinating from the White House that drags EPA along."

Utilities may profit from a seat at the table

Most observers agree that a grand bargain of the same kind that includes buy-in from the regulated industry is less likely for power plants. But utilities are likely to participate in writing the rules nonetheless.

Joe Mendelson, who helped bring about the regulation of greenhouse gas emissions under the Clean Air Act, said there are actually some similarities between the position of the automotive industry in 2010 and the one utilities find themselves in now.

"It's obviously not exact parallels, but you're looking at an industry sector that's dealing with some pretty significant changes, and that has got regulatory pressure hanging out there with both EPA and regional programs," he said.

Utilities are more heterogeneous than automakers, Mendelson said, with different interests and concerns, but they should still start shifting their efforts away from fighting EPA greenhouse gas regulation in court and by other means, and toward earning a seat at the negotiating table.

"The legal situation is such that the law's not going to change, so it becomes incumbent on them to become engaged in shaping what the regulations look like going forward," said Mendelson, who will join the Senate Environment and Public Works Committee staff as chief climate counsel next week.

"It may not be a peace accord type of agreement, but the process that's going to go forward will have to yield that kind of outcome, I would expect," he said.

CATF's Schneider said even power companies with coal-heavy portfolios have something to gain from talking to EPA.

"I wouldn't rule out the possibility that even companies with coal generation could see themselves being advantaged by rules like this," he said.

For example, many of the same utilities are also facing EPA rules for mercury, smog, soot and other emissions, and knowing now what their carbon-related requirements will be might head off unnecessary investment in a power plant that they might otherwise choose to close, he said.

"They might avoid stranding costs in one emissions control or the other if they knew there was a carbon rule coming," Schneider

said.

Sen. Tom Carper (D-Del.) worked for years on legislation that would have coordinated Clean Air Act rules for a variety of pollutants, but he stopped introducing his "Three-P's" bill in the previous Congress, citing a lack of utility interest. Schneider said that was exactly the kind of effort utilities might want to revive now.

"There were enough shortsighted utilities that kind of took the head-in-the-sand, drag-the-feet perspective that really weighs down that effort," he said. "And I think that to the extent that companies and their ratepayers are going to pay the cost of that now -- if there are costs in this -- then that will show that Carper was wise and that they were not."

Hannegan saw a different opportunity for collaboration. The Clean Air Act will prove a cumbersome way to limit greenhouse gases, he predicted, and proponents of regulation will find they have to ask Congress to approve amendments to it.

"At that point, you do need that coalition," he said. "So that when members of Congress turned to utilities in their district, the utilities are supportive, and they say, 'This is the right thing for the country and the right thing for us.'"

## BIOFUELS:

Energy companies buckle up in hope of green aviation takeoff

Amanda Peterka, E&E reporter

Published: Wednesday, January 16, 2013

Second of three stories about airline biofuels. [Click here](#) for the first part.

**SOUTH SAN FRANCISCO, Calif.** -- The future of aviation fuels is cooking in a bland office park here in the biotech Silicon Valley, about 10 miles south of San Francisco.

In vertical tanks similar to those used by brewers, genetically engineered algae are gorging on sugar, converting it to a common type of oil. In only a few days, the microscopic organisms will become bloated, with upward of 75 percent of their body weight made of oil.

The algae cook is Solazyme Inc., which has learned to tailor the oil for aviation with properties not unlike petroleum-based fuel. In 2011, United Airlines Inc. flew the first commercial U.S. flight on a 50-50 blend of gasoline and Solazyme's algae-derived jet fuel. Although the operation here isn't commercial-scale, airlines are excited by the technology's prospects.

"They've figured it out, from our perspective, how to get to commercial," said Jimmy Samartzis, managing director of global sustainability for United Airlines.

Solazyme is among a handful of advanced biofuel producers working on different technologies to scale up production of jet fuel from renewable materials.

Algae are busy churning out oil inside 600-liter fermentation tanks at Solazyme's pilot plant in south San Francisco. All photos courtesy of Amanda Peterka.

Companies are in various stages of commercialization and are working with feedstocks that range from woody biomass to municipal trash and technologies that include fermentation, thermochemical processes and alcohol-to-jet. The fuels, though made from different technologies, have two things in common: Unlike ethanol, they are all drop-in fuels that can be used in existing infrastructure. And they are made from feedstocks other than corn.

The road isn't easy: Capital costs for most advanced biofuel producers are high, and aviation fuels face competition from diesel and other markets that are more profitable in the short term for producers.

Still, companies like Solazyme say they see long-term opportunity in the demand from the aviation industry, which is looking toward biofuel to deal with escalating fuel costs, a growing customer base, and both internal goals and regulatory pressure to cap carbon dioxide emissions.

"You can see the inherent approval in this industry that people [in the aviation industry] have," said Graham Ellis, vice president of business development at Solazyme. "They want to make this happen, they have made it happen, and now it's simply a matter of completing the scale-up."

To Solazyme co-founder and CEO Jonathan Wolfson, the first to successfully scale up technology will be companies that deal in triglycerides, the oil produced by the algae in Solazyme's vats.

The oil compounds, consisting of a glyceride attached to three fatty acids in the shape of an E, are some of the most abundant substances on Earth.

"The largest-volume liquid on the planet is water. The second-largest is petroleum. The third is a cheat; it's liquid natural gas. But the fourth is triglyceride," Wolfson said in a recent interview. "All plant oil and all animal fat are triglycerides. It is the only one of those four liquids that is a direct ingredient in every major market."

Tricks of the trade

At Solazyme's pilot plant in South San Francisco, after the algae are filled with oil, they are removed from the fermentation tanks and fed into a dryer. A dry mixture of cells appears on the other end, and from that Solazyme extracts the oil.

Solazyme's trick is that the company has figured out how to tailor the triglycerides to different types of products by genetically engineering the algae strains. The company can make oils, for example, that are especially tailored to soap to improve lathering

performance.

For jet fuel, tailoring allows Solazyme to address a main market barrier to producing aviation biofuels: the yield loss in making jet fuel compared with making diesel.

In general, companies have so far moved faster to produce diesel than they have to produce jet fuel, finding the former more attractive. Diesel has a much larger market, and natural triglycerides are typically about 20 carbons in length, longer than the 14- to 18-carbon chain needed to make jet fuel.

Through tailoring, "we can drop the chain length right down into the jet range, and all of a sudden, for the first time, the world has a perfect triglyceride oil tailor-made for making jet at high yield," Ellis said. "Theoretically, you can make jet at the same cost as diesel today by utilizing our type of technology because we can make the right oil up front and boost the yields accordingly." In labs that span the second floor of the building that houses the fermentation tanks, Solazyme scientists have screened hundreds of thousands of different strains of algae to find optimal varieties. Pipettes and vials line countertops, and scientists hover over small versions of the fermentation tanks on the floor below.

"We're tweaking it," Ellis said. "What can we do to get algae to produce more oil, to do it faster, to do a different chain length, a different composition? That's what's going on here. This is really creating new bugs, or advancing the bugs we've got, and making sure we've got a good selection ready" for commercialization.

Other companies are also working on tailoring oil, but Solazyme's algae technology is unusual in the field.

Wolfson and co-founder Harrison Dillon founded Solazyme in 2003 after discussing the possibility of using algae and molecular biology to produce fuels in college. The two began with a vision of growing algae in ponds and photobioreactors but realized about a year in that such processes would not work economically on a large scale to produce fuels and chemicals.

So they began to feed the algae sugars rather than have the algae do photosynthesis themselves to produce them. The shift in production method was a turning point, Wolfson says, because it enabled the company to use fermentation equipment that had been developed in other industries, such as beer, pharmaceuticals and animal feed. The tanks in the company's pilot plant in South San Francisco are, in fact, taken from those industries.

They are only a fraction of the size of the 500,000-liter tanks being constructed in a plant in Brazil, part of a joint venture between Solazyme and Bunge Ltd., a global agribusiness and food company. The tanks in Brazil, about 5 meters across and five stories high, will be the backbone of Solazyme's first commercial-scale facility, set to begin operating in late 2013 (Greenwire, Dec. 4, 2012).

Solazyme on Dec. 13 also announced that 500,000-liter tanks were successfully used for fermentation at a plant in Clinton, Iowa, that is owned by Archer Daniels Midland Co. Solazyme is expected to begin producing 20,000 metric tons of oil at the plant starting in 2014 and scale up to 100,000 metric tons, the same capacity as the Bunge facility.

Solazyme has sampled hundreds of thousands of strains of algae looking for the best ones to tailor oils for use in jet fuel, cosmetics, food and other products.

But like many other companies working in advanced biofuels, Solazyme will not necessarily produce the oils needed for fuels at the plants, or right away, despite its involvement so far in testing in both commercial and military planes and a partnership with United Airlines.

"We haven't said publicly where we expect to enter the aviation market, and I think that we're not at a position to comment on that right now, either, other than to say that just as recently as this summer ... the Navy fighter jets and the helicopters were flying on our fuel," Wolfson said. "We continue to be demonstrating that our fuel is a complete drop-in replacement, not just with commercial aviation but with military aviation."

At the Brazil plant, Solazyme is focusing first on its commercial lines of cosmetics and food products that can be made from its tailored oils.

"Our focus has to be on, now that we've invested a decade in this technology and many hundreds of millions of dollars, our focus is on broad commercialization," Wolfson said. "Initially, your very first volumes here are a lot less likely to be fuels than they are some of the higher-value oil applications."

'Right market in the long term'

It's a similar story for other companies in advanced biofuels broadly. In the short term, the economics are more skewed toward chemicals than fuels, and in the fuels field they're more skewed toward ground-based biofuels rather than aviation biofuels.

Still, there are "parallel technology platforms which are now emerging" to commercialize aviation biofuels, Jim Rekoske, vice president and general manager of the renewable energy and chemicals business unit at UOP LLC, said at a recent conference in Washington, D.C.

Rekoske said that the opportunity for biofuels companies is in the long term. UOP, the refining technology subsidiary of Honeywell International Inc., is another major player in the renewable aviation fuels arena and is working on thermal processing technology to rapidly convert solid biomass like corn stover and forest materials into liquid fuel.

The company, which is largely a technology licensor to other companies in the field, is currently building a demonstration plant in Hawaii with a \$25 million award from the Department of Energy. The plant, located at a Tesoro Corp. refinery, is producing fuel



but will not be fully operational until 2014. The completed plant will be able to produce more transportation fuel per dry metric ton of biomass than traditional ethanol.

UOP also recently added an alcohol-to-jet process to its repertoire and submitted about 100 gallons of the fuel to the Federal Aviation Administration and Air Force research labs for testing. Rekoske says the company likely will be ready to license the technology by the middle of 2013.

Asked whether he believes cost-effective biofuels are feasible, Rekoske answered with what he called an "emphatic yes." In an interview in December, Rekoske said that he anticipates there will be some "short-term dysfunction."

"Long term is what you should be planning business for. There are other options for road transport -- electrify vehicles, use more barges and road transport -- but ultimately, if we want to continue to fly and travel rapidly, we're going to have to use jet," Rekoske said. "As far as the people in aviation told me, it's going to be difficult to electrify planes. So our view is that it's the right market in the long term."

There are several other companies working on aviation fuels, many of which are leading a broad push on ground-transportation biofuels.

Colorado-based Gevo Inc., for example, is also focusing on alcohol-to-jet. The company is built around isobutanol, a building block for petrochemicals that can be made from both traditional corn feedstocks and cellulosic materials (Greenwire, Oct. 10, 2012).

KiOR Inc. is leading a group of companies that is working to certify pyrolysis -- a thermal chemical technology -- for use in jet fuel under the ASTM process. Earlier this year, the Texas-based company announced it had started operating a plant in Mississippi that takes in plant-based feedstocks. The process, the company said, is capable of producing renewable crude oil in a matter of seconds.

Solena Fuels LLC of D.C. is using waste feedstocks to create jet fuel. Solena has a renewable plant in England that in December signed a purchase agreement with British Airways to supply jet fuel for the next 10 years. The company uses a Fischer-Tropsch process that converts the waste to synthesis gas and then into fuel through a combination of heat and catalysts.

Wisconsin-based Virent Inc., known mostly for its work producing plant-based plastic bottles, is working to produce jet fuel from pine tree sugars. Earlier this year, the company announced that it had successfully converted the biomass to jet fuel from a catalytic process in partnership with Virdia. The fuel passed testing at the Air Force Research Laboratory.

Aemetis Inc., based in California, has licensed technology from Chevron Lummus Global Biofuels that allows it to produce renewable jet fuel by engineering microbes and enzymes that is a 100 percent replacement for petroleum- and diesel-based fuel. The company has retrofitted and owns a 55-million-gallon plant in California.

'Tied up in Washington'

The push for aviation biofuels is being held back by policy uncertainty, said John Plaza, CEO of Imperium Renewables Inc. in Washington state, which is also working with Chicago-based LanzaTech NZ Ltd. on technology that will convert biomass-based alcohols to hydrocarbon fuels for aviation.

Imperium began the research in 2010 and received a \$4 million grant from the Department of Energy in 2011 with LanzaTech, Boeing Co., the National Renewable Energy Laboratory and the Pacific Northwest National Laboratory.

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"Overall, I think we're a couple of years behind where we hoped to be in 2010 and 2011, when things seemed to be brighter," Plaza said. "It's tied up in Washington. There's a stagnation in many industries as we wait for the government to figure out its role and how to subsidize the petroleum industry in the future. All of that combined together has created a lot of uncertainty for companies like Imperium and others to provide a solution."

But like other executives who have thrown their weight behind alternative fuels, he expressed optimism.

"While I'm frustrated that the pace of opportunity has been slower than we had hoped, longer term I still feel there's a tremendous potential for this industry," Plaza said.

The lack of commercial supply of aviation biofuels has also put airlines in a bind. The aviation industry has set goals of carbon-neutral growth by 2020 and a reduction in emissions by half by 2050 compared with 2005 levels, but it does not yet have the supply to get there.

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The problem is of the chicken-and-egg variety, said Carol Sim, director of environmental affairs at Alaska Airlines, which is involved with commercializing aviation biofuel in the Pacific Northwest.

"There's interest from feedstock suppliers, interest from the refining industry," she said, "but if they can't have some guarantee that there's going to be a market after they make the capital investment, they're hesitant to start the process."

"For us, although we are large in our region, we only have 3 percent of the domestic capacity in the passenger airline industry," Sim added. "Even though we may want to do something, from a national standpoint, we're a very small company. We just don't have the buying capacity to really influence much."

Solazyme's Wolfson said he can sympathize with doubters of the industry and the renewable fuel standard -- of which there are several in D.C. -- but points to the "enormous progress" made over the last few years.

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The Department of Energy halted construction months ago amid concerns about the plant's eventual safe operation and technical issues.

DOE is considering whether to feed waste into one of two parts of the facility depending on radioactivity rather than feed it into a pretreatment facility.

The plant would convert millions of gallons of radioactive waste into glasslike logs for storage. Currently, the site's waste is stored in underground tanks that have leaked into groundwater (Shannon Dininny, Seattle Post-Intelligencer, Jan. 15). -- MM

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